The Interaction of Thioorganic and Thiophosphoroorganic Additions to Oils With Metals

thiophosphite starts which may be regarded as the upper limit of the protective action. A film of iron phosphide is more easily formed on steel than a sulfide film. At a temperature increase sulfur reacts more intensively with copper than with steel.
There are 5 graphs, 1 table and 6 references, 5 of which are Soviet and 1 American.

SUBMITTED: January 22, 1958

Card 2/2

KUSAKOV, M.M.; RAZUMOVSKAYA' E.A.; DEKARTOV, A.P.

Radioactive indicator study of the interaction between elemental sulfur and thin copper films in a carbon medium. Zhur. prikl. khim. 33 no.11:2466-2470 N '60. (MIRA 14:4)
(Sulfur—Isotopes) (Copper)

S/081/62/000/005/077/112
B162/B101

AUTHORS: Kusakov, M. M., Sanin, P. I., Razumovskaya, E. A., Ul'yanova, A. V., Dekartov, A. P.

TITLE: Investigation of the mechanism of interaction of tributyl trithiophosphite in a hydrocarbon medium with thin layers of copper by the radioactive indicator method

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 5, 1962, 527, abstract 5M209 (Sb. "Prisadki k maslam i toplivam". M., Gostoptekhizdat, 1961, 207-213)

TEXT: An investigation is made of the kinetics of the interaction of tributyl trithiophosphite (I) solutions labeled with S^{35}, P^{32}, or C^{14}, in the naphtheneparaffin fraction of [illegible]-20 (MS-20) oil at temperatures from 70 to 130°C with thin layers of copper (from 70 to 1000 Å), obtained by the method of evaporation copper in vacuum and deposited on a degreased

Card 1/2

glass; concentration of I in oil is 0.1 moles/liter. It is shown that in the interaction of the solution I with copper films are formed which contain S, P, and C. It is assumed that I, on reacting with copper at an increased temperature, decomposes according to the equation $SI \rightarrow 2PH_3 + 9C_4H_9SH + 15C_4H_8 + 3P_2S_5$. The separated C_4H_9SH with copper forms $(C_4H_9S)_2Cu$ which, at an increased temperature, decomposes into $CuS + 2C_4H_8 + H_2S$, and PH_3 with copper forms phosphide. It is concluded that the films which are formed in the interaction of I with copper contain sulfide, phosphide, and mercaptide of copper, and the product of reaction of the hydrocarbon radical I with copper. [Abstracter's note: Complete translation.]

Card 2/2

GUSEL'NIKOV, L.Ye.; KOPYSHKIN, A.Ya.; KOSHMIEVA, I.M.; KUSAKOV, M.A.; RAZUMOVSKAYA, E.A.

Relation between the molecular weight and intrinsic viscosity of some organosilicon polymers. Vysokom. soed. 7 no.5:860-865 My '65. (MIRA 18:9)

1. Institut neftekhimicheskogo sinteza AN SSSR.

KUSAKOV, M.M.; KOSHEVNIK, A.Yu.; RAZUMOVSKAYA, E.A.

Photoelectric instrument for investigating light scattering in polymer solutions. Vysokom.soed. 5 no.5:756-759 My '63. (MIRA 17:3)

1. Institut neftekhimicheskogo sinteza AN SSSR.

TOPCHIYEV, A.V. [deceased]; KUSAKOV, M.M.; KALYUZHNAYA, G.D.; KAPTSOV, N.N.; KOSHEVNIK, A.Yu.; RAZUMOVSKAYA, E.A.

Characteristics of the properties of homo- and copolymers of 2-methyl-5-vinylpyridine obtained by the methods of light scattering and viscosimetry. Neftekhimiia 3 no.1:90-93 Ja-F '63. (MIRA 16:2)

1. Institut neftekhimicheskogo sinteza AN SSSR.
(Pyridine) (Polymers)
(Light—Scattering) (Viscosimetry)

S/204/63/003/001/008/013
E075/E436

AUTHORS: Topchiyev, A.V. (deceased), Kusakov, M.M., Kalyuzhnaya, G.D., Kaptsov, N.N., Koshevnik, A.Yu., Razumovskaya, E.A.

TITLE: Characterization of the properties of homo- and copolymers of 2-methyl-5-vinylpyridine by the methods of light scattering and viscosimetry

PERIODICAL: Neftekhimiya, v.3, no.1, 1963, 90-93

TEXT: The authors determined the molecular weights and other properties of polymerized 2-methyl-5-vinylpyridine and its 1:1 copolymer with styrene. The polymerizations were carried out by heating 2-methyl-5-vinylpyridine at 80°C for 12 hours in glass ampules with 0.1% benzoylperoxide. From the light scattering and viscosimetry data the following relationship was obtained

$$[\eta] = 6.17 \times 10^{-4} M_w^{0.615}$$

where $[\eta]$ - intrinsic viscosity and M_w - mean molecular weight. The mean molecular weights of the polymer fractions obtained by

petroleum-ether precipitation, ranged from 1 x 10^6 to 3 x 10^4. The mean molecular weights of the copolymer were 4.3 x 10^5 and 1.1 x 10^5 for the polymerization times of 12 and 6 hours respectively. There is 1 table.

ASSOCIATION: Institut neftekhimicheskogo sinteza AN SSSR
(Institute of Petrochemical Synthesis AS USSR)

SUBMITTED: August 18, 1962

S/204/63/003/001/008/013
E075/E436

AUTHORS: Topchiyev, A.V. (deceased), Kusakov, M.M., Kalyuzhnaya, G.D., Kaptsov, N.N., Koshevnik, A.Yu., Razumovskaya, E.A.

TITLE: Characterization of the properties of homo- and copolymers of 2-methyl-5-vinylpyridine by the methods of light scattering and viscosimetry

PERIODICAL: Neftekhimiya, v.3, no.1, 1963, 90-93

TEXT: The authors determined the molecular weights and other properties of polymerized 2-methyl-5-vinylpyridine and its 1:1 copolymer with styrene. The polymerizations were carried out by heating 2-methyl-5-vinylpyridine at 80°C for 12 hours in glass ampules with 0.1% benzoylperoxide. From the light scattering and viscosimetry data the following relationship was obtained

$$[\eta] = 6.17 \times 10^{-4} M_w^{0.615}$$

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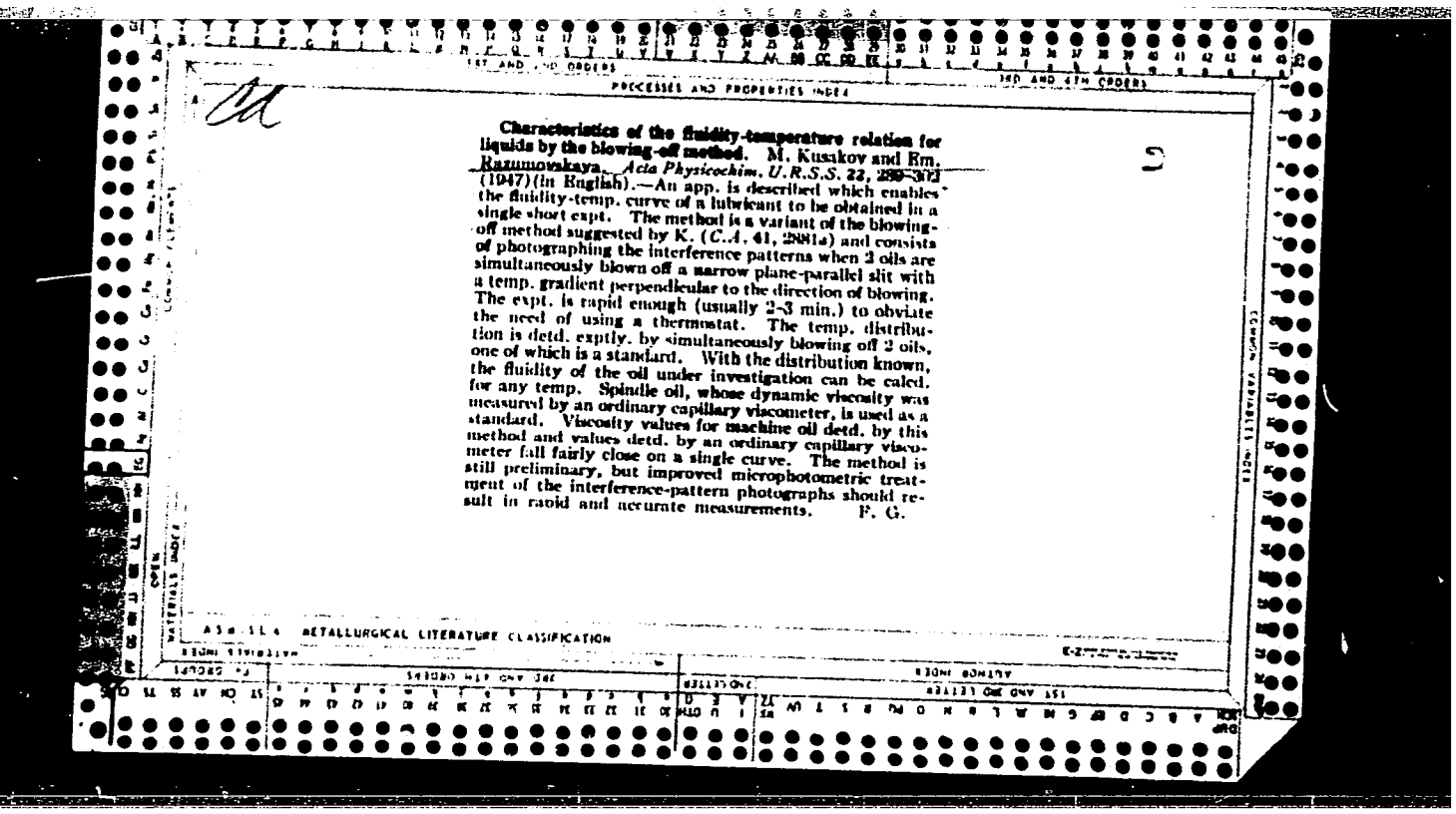
petroleum-ether precipitation, ranged from 1×10^6 to 3×10^4. The mean molecular weights of the copolymer were 4.3×10^5 and 1.1×10^5 for the polymerization times of 12 and 6 hours respectively. There is 1 table.

ASSOCIATION: Institut neftekhimicheskogo sinteza AN SSSR
(Institute of Petrochemical Synthesis AS USSR)

SUBMITTED: August 18, 1962



PROCESSES AND PROPERTIES INDEX

Characteristics of the fluidity-temperature relation for liquids by the blowing-off method. M. Kusakov and Em. Razumovskaya. *Acta Physicochim. U.R.S.S.* 22, 289–302 (1947)(In English).—An app. is described which enables the fluidity-temp. curve of a lubricant to be obtained in a single short expt. The method is a variant of the blowing-off method suggested by K. (*C.A.* 41, 2881a) and consists of photographing the interference patterns when 2 oils are simultaneously blown off a narrow plane-parallel slit with a temp. gradient perpendicular to the direction of blowing. The expt. is rapid enough (usually 2-3 min.) to obviate the need of using a thermostat. The temp. distribution is detd. exptly. by simultaneously blowing off 2 oils, one of which is a standard. With the distribution known, the fluidity of the oil under investigation can be calcd. for any temp. Spindle oil, whose dynamic viscosity was measured by an ordinary capillary viscometer, is used as a standard. Viscosity values for machine oil detd. by this method and values detd. by an ordinary capillary viscometer fall fairly close on a single curve. The method is still preliminary, but improved microphotometric treatment of the interference-pattern photographs should result in rapid and accurate measurements. F. G.

METALLURGICAL LITERATURE CLASSIFICATION

RAZUMOVSKAYA, L. I.

"Characteristics of the Fluidity-Temperature Relation for Liquids by the Blowing-off Method." Dok. AN. No. 2, 22, 1947; Acad. of Sci. Inst. of Mineral Fuels, Lab. of Physical Chem. of Petroleum, c1946-.

MAKOKLIN, I.A.; VERNIDUB, I.I.; ZHVANKO, Yu.N.; KARPOV, V.T.; RAZUMOVSKAYA, G.S.; VOL'KHOVSKAYA, A.A.

Kinetics of the oxidation of fine magnesium powders at high temperatures. Zhur.prikl.khim. 33 no.4:824-831 Ap '60. (MIRA 13:9)

1. Moskovskiy ordena Trudovogo Krasnogo Znameni institut narodnogo khozyaystva imeni G.V.Plekhanova.
(Magnesium) (Powder metallurgy) (Oxidation)

S/179/60/000/006/035/036
E081/E135

AUTHORS: Bartenev, G.M., Panshin, B.I., Razumovskaya, I.V., and Finogenov, G.N., (Moscow)

TITLE: The Longevity of Organic Glass Under Cyclic Loading

PERIODICAL: Izvestiya Akademii nauk SSSR,Otdeleniye tekhnicheskikh nauk, Mekhanika i mashinostroyeniye, 1960, No. 6, pp. 176-179

TEXT: The paper is a continuation of previous work (Ref.4). According to experimental and theoretical work (Refs.1-4) the longevity of plastics under load is expressed by the approximate formula:

$$\tau = Ae^{-\alpha\sigma} \qquad (1)$$

where τ is the longevity at constant stress σ; the constants A and α depend on the type of material. In the present paper the longevity of polymethylmethacrylate is investigated under cyclic conditions, the stress cycle having a saw-tooth form, with maximum stress σ_2, minimum stress σ_1, and period θ; the quantity $v = (\sigma_2 - \sigma_1)/(1/2\theta)$ defines the velocity of increase

Card 1/ 5

The Longevity of Organic Glass Under Cyclic Loading

or decrease of the stress. Following Bailey (Ref.7), application of Eq.(1) to these stress conditions leads to:

$$t = \alpha \frac{(1 - 1/k)\,\sigma_2}{1 - \exp\left[-\alpha(1 - 1/k)\,\sigma_2\right]}\,\tau_2 \qquad (6)$$

for the longevity t, where τ_2 is the longevity at constant stress σ_2, and k is the ratio σ_2/σ_1. In terms of the longevity τ^o at constant stress $\sigma_0 = 1/2(\sigma_1 + \sigma_2)$, the longevity t under cyclic conditions is given by Eq.(7). The testing was carried out in a special apparatus in pure tension at a frequency of 10 cycles/min and at 20 °C under the condition that k had a constant value of 10. The data are given in Fig.2, in which the ordinate is the logarithm of the longevity in minutes and the abscissa is the maximum stress in kg/mm^2; curve 1 is the time dependence of the longevity under steady stress, curve 2 is calculated from Eq.(6) and the experimental results for cyclic stress are shown in curve 3. The condition of variable k was

The Longevity of Organic Glass Under Cyclic Loading

also considered. The experimental and calculated values are compared in Fig.3 as graphs of $\sigma^o/\sigma_п$ where σ^o is the average of the maximum and minimum stresses in a cycle, and $\sigma_п$ is the tensile strength measured in a testing machine; curve 1 is the time dependence of strength, curves 2, 3 and 4 are experimental (10 cycles/min), corresponding to variable minimum stress σ_1 and different constant maximum stresses σ_2 of: curve 2 - 0.9 $\sigma_п$; curve 3 - 0.8 $\sigma_п$; curve 4 - 0.7 $\sigma_п$; $\sigma_п$ = 8.6 kg/cm^2. Curves 2', 3' and 4' are calculated from:

$$t = \alpha \frac{w\Theta}{2} \frac{\exp\left(\frac{1}{4}\alpha w\Theta\right)}{\exp\left(\frac{1}{2}\alpha w\Theta\right) - 1} \tau^o \qquad (7)$$

Fig.2 shows that the longevity curve for cyclic loading is not a simple one, and only coincides with the theoretical curve for small times and large maximum stresses. The possible part played by such factors as the heating of the specimen and the occurrence of microcracks is discussed. The curves of Fig.3

S/179/60/000/006/035/036
E081/E135

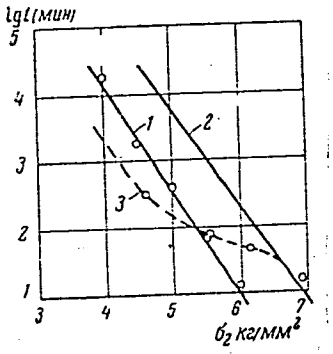
The Longevity of Organic Glass Under Cyclic Loading

show that the larger deviations of the experimental from the calculated curves occur at the smaller values of σ_1. The application of Bailey's method for calculating the longevity of plastics based on the time dependence of strength leads to disagreement with experimental data in the practically important region involving a large number of cycles to fracture. For a small number of cycles to fracture, the calculated and experimental curves practically coincide.
There are 3 figures and 10 references: 7 Soviet and 3 English.

Card 4/5

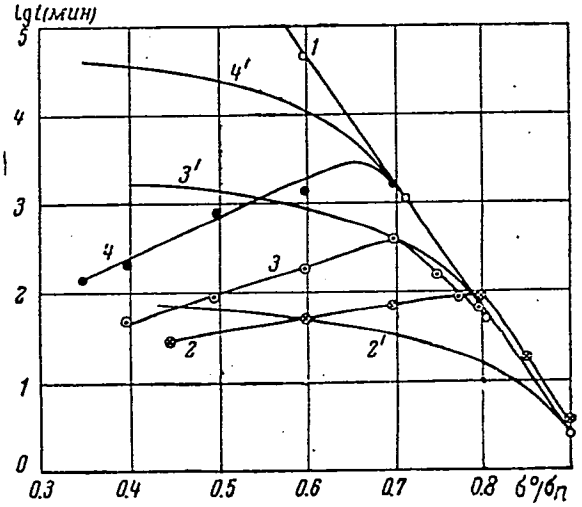
S/179/60/000/006/035/036
E081/E135

The Longevity of Organic Glass Under Cyclic Loading



Фиг. 2

Fig.2



Фиг. 3

SUBMITTED: April 13, 1960

Card 5/5

RAZUMOVSKAYA, I. V.

S/020/60/133/02/24/068
B019/B060

AUTHORS: Bartenev, G. M., Razumovskaya, I. V.

TITLE: Theoretical Strength and Critical Break Stress of Solids

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 133, No. 2, pp. 341-344

TEXT: In the introduction the authors define the theoretical strength according to Born (Ref. 1) and Zwicky (Ref. 2), and the critical stress is defined as being the maximum of quasielastic strength at the tips of cracks in the material. It is shown that when developing the formulas for the physical theory of the strength, one must proceed from the critical stress and not from the theoretical strength. On the basis of a generalized crack model according to Griffith and P. A. Rebinder (Ref. 8), shown in Fig. 2, the kinetic theory of the growth of a crack is illustrated with the aid of the scheme of the changes in the potential energy shown in Fig. 3. The authors then deal in greater detail with the calculation of the technical strength according to Griffith (Ref. 9) and the theoretical strength according to Orowan (Ref. 10). These formulas

Card 1/2

yield good estimations of the values. Since, however, they contradict the law of conservation of energy, one cannot expect exact results. It may be seen from these considerations that the critical stress cannot be calculated, but only estimated. There are 3 figures and 13 references: 6 Soviet, 3 German, 3 American, and 1 British.

ASSOCIATION: Moskovskiy gorodskoy pedagogicheskiy institut im. V. P. Potemkina (Moscow Municipal Pedagogical Institute imeni V. P. Potemkin)

PRESENTED: March 14, 1960, by P. A. Rebinder, Academician

SUBMITTED: March 2, 1960

VB

S/058/63/000/003/066/104
A059/A101

AUTHORS: Demishev, G. K., Razumovskaya, I. V.

TITLE: The problem of the theoretical strength of solids

PERIODICAL: Referativnyy zhurnal, Fizika, no. 3, 1963, 52, abstract 3E346 ("Steklo. Byul. Gos. n.-i. in-ta stekla", 1962, no. 2 (115), 30 - 36)

TEXT: The term "theoretical strength" is considered which is understood as the maximum quasi-elastic force in the uniform deformation of an ideal solid free from defects in the absence of heat fluctuations. The destruction process in the case considered represents a dissociation and differs from the real destruction process with the formation of new free surfaces of rupture. The binomial formula for the potential energy of a particle, $U(r) = -A/r^m + B/r^n$ is examined which is correct for any type of chemical bond. The quasi-elastic force F, the equilibrium distance r_o between the particles, and the distance between particles which corresponds to the maximum force are calculated. The elongation of the bond (or the deformation of the homogeneous body) at break,

Card 1/2

S/058/63/000/003/066/104
A059/A101

The problem of the theoretical strength of solids

$\Delta r/r_o = [n+1/(m+1)] - 1$, is compared (for small deformations) with $FN = E\Delta r/r_o$ where F is the external force allotted to one bond, N the number of bonds per 1 cm^2 of the unstretched body perpendicular to stretch, and E is Young's modulus. The relation $\sigma_{max} = aE_o$ was obtained for the theoretical strength where $a = [1/(n+1)] \cdot [(m+1)/(m-1)]^{(m+1)/(n-m)}$. The coefficient a is independent of the form of uniform deformation and the direction of stretch. For NaCl assuming $m = 1$, $n = 10$, $a = 0.6$, and for metals, $a = 0.15$ was obtained. The concept of the theoretical strength for real composite materials and the ways of taking into account the redistribution of bonds in deformation and the presence of structural defects were considered. Elongation at break depends on the nature of the bonds and can vary between 50 and 10%.

L. Mirkin

[Abstracter's note: Complete translation]

Card 2/2

ACCESSION NR: AT4030811 S/0000/63/000/000/0325/0332

AUTHOR: Bartenev, G. M.; Razumovskaya, I. V.

TITLE: On the effect of surface active media on the breakdown kinetics of solid bodies

SOURCE: AN UkrSSR. Institut metallokeramiki i spetsial'ny*kh splavov. Poverkhnostny*ye yavleniya v rasplavakh i protsessakh poroshkovoy metallurgii (surface phenomena in liquid metals and processes in powder metallurgy). Kiev, Izd-vo AN UkrSSR, 1963, 325-332

TOPIC TAGS: surface tension, surface active medium, breakdown kinetics, overstress

ABSTRACT: In this paper the authors examined the effect of the surface active media on the prolonged stability and the development of breakdown in large bodies. The breakdown of solid bodies is an exchange process, but the condition of the body surface, particularly its surface tension, substantially influences the magnitude of stability and the rate of breakdown. Through a series of mathematical arguments, the authors derived formulas for calculating the rate of breakdown. It was found that a number of materials (silicate glass, solid polymers) have a different time dependence stability in surface active medium than in an inactive medium. The

Card 1/2

ACCESSION NR: AT4030811

authors assumed that the front of the monomolecular layer moves with a certain average velocity U. In reality, at small pressures and crack a velocity less than U, the slowest molecules of the medium lag behind the crack, and the length of time is found to be more than that calculated. On the other hand, even at a growth velocity of the crack greater than U, the portion of the fast molecules keeps pace with the growing crack, affecting its velocity; the time interval proves to be less than that calculated. Orig. art. has: 11 formulas and 2 figures.

ASSOCIATION: Moskovskiy gosudarstvenny*y pedagogicheskiy institut im. V. I. Lenina (Moscow State Pedagogical Institute)

SUBMITTED: 23Nov63 DATE ACQ: 16Apr64 ENCL: 00

SUB CODE: PH, CH NO REF SOV: 006 OTHER: 003

Card 2/2

L 12411-63 EPR/EWP(j)/EPF(c)/EWP(q)/EWT(m)/BDS AFFTC/ASD Ps-4/Pc-4/ Pr-4/Pq-4 RM/WH/JD

ACCESSION NR: AP3001400 S/0020/63/150/004/0784/0787

AUTHOR: Bartenev, G. M.; Razumovskaya, I. V.

TITLE: Time dependence of the strength of brittle solids in surface-active media

SOURCE: AN SSSR. Doklady, v. 150, no. 4, 1963, 784-787

TOPIC TAGS: strength of materials, brittleness, surface-active media, crack propagation in solids, polymethylcrylate

ABSTRACT: The fluctuation theory of the strength of brittle solids in a passive medium developed by Bartenev (Izv. Akad. Nauk SSSR, OTN, No. 9, (1953), page 53) is extended to the study of the time dependence of the strength in surface-active media. The effect of the medium on the kinetics of the growth of the already-existent cracks is considered. Three stages of the process of rupture under stress and under effect of thermal fluctuations are distinguished. When the velocity of crack propagation v is smaller than the rate of surface diffusion v sub D, the former is determined by the surface-active medium. When v becomes equal to v sub D, it increases abruptly in steps until v is larger than v sub D.

Card 1/2

L 12411-63

ACCESSION NR: AP3001400

3

At this stage, the growth of the crack is not affected by the surface-active medium. Expressions are derived for these three stages giving the time between the application of stress and the rupture as a function of temperature, form factor, stress, and some other parameters. Experimental curves for time vs. stress for glass and for polymethylmetacrylate are compared with the theoretical expressions. Orig. art. has 5 equations and 2 figures.

ASSOCIATION: Moskovskiy gosudarstvenny*y pedagogicheskiy i. titut im. V. I. Lenina (Moscow State Pedagogic Institute)

SUBMITTED: 08Feb63 DATE ACQ: 01Jul63 ENCL: 00

SUB CODE: 00 NO REF SOV: 008 OTHER: 003

Card 2/2

ACCESSION NR: AP4019822 S/0181/64/006/003/0657/0661

AUTHORS: Bartenev, G. M.; Razumovskaya, I. V.

TITLE: The theory of time dependence of strength in solid polymers

SOURCE: Fizika tverdogo tela, v. 6, no. 3, 1964, 657-661

TOPIC TAGS: solid state physics, polymer strength, tensile strength

ABSTRACT: The authors have examined large-scale failure of solid polymers under the effect of steady tension for two limiting cases: 1) at low temperatures and high stresses, when the specimen's life is determined chiefly by the growth of one of the more dangerous fractures; and 2) at comparatively high temperatures (but below the glass point) and low stresses, when the specimen's life is determined chiefly by the development of "silver" fractures, and the subsequent growth of failure cracks occupies but a small part of the lifetime of the sample. They show that, despite the difference in mechanisms, the time dependence of strength in both cases is expressed by the formula of S. N. Zhurkov $\tau = \tau_0 e^{\frac{U_0 - \gamma\sigma}{kT}}$ (S. N. Zhurkov and B. N. Narzullayev, ZhTF, 23, 1677, 1953), but with somewhat different values for

Card 1/2

ACCESSION NR: AP4019822

the coefficients τ_0 and γ. U_0 is the "zero" activation energy of the failure process, T the temperature, and σ the tensile stress. The difference in τ_0 is practically imperceptible. The difference in γ leads to some distortion in the dependence of log τ - σ in the temperature interval between the extremes here investigated. Orig. art. has: 2 figures and 6 formulas.

ASSOCIATION: Moskovskiy gosudarstvenny*y pedagogicheskiy institut im. V. I. Lenina (Moscow State Pedagogical Institute)

SUBMITTED: 25Feb63 DATE ACQ: 31Mar64 ENCL: 00

SUB CODE: SS NO REF SOV: 009 OTHER: 001

Card 2/2

BARTENEV, G. M.; RAZUMOVSKAYA, I. V.

"Concerning the method of evaluating the strength of an oriented solid polymer"

paper submitted for Intl Conf on Fracture, Sendai, Japan, 13-16 Sep 65.

Moscow.

РАЗУМОВСКАЯ, Л.Н.

USSR/Cultivated Plants - Grains M-4

Abs Jour : Ref Zhur - Biol., No 1, 1958, No 1541

Author : L.N. Razumovskaya
Inst : Not Given
Title : The Effect of Mineral Fertilizers on Buckwheat Formation

Orig Pub : Sb. nauch. tr. Ivanovsk. s. kh. in-ta, 1956, issue 14, 158-166

Abstract : Surveys made in the training farms of the Ivanovskiy agricultural institute (1951-1953) have established that, by raising buckwheat in turf-podzolic dusty-argillaceous soils, the introduction of NPK before sowing, considerably increases the yield (on a 2 year average the increase amounted to 2.5 centners per hectare or 22%). Using nitrogenous adfeeding at germination and during budding, has increased the yield of grain on a 2 year average by 1.2 centners per hectare or 8.9%. The adventitious-root supplemental feeding with boron (B) during the period of mass blooming, increased the grain yield by 1.9 centners per hectare or 11.8%; by liming the soil, the yield increase amounted to 1.8 centners perhectare or 13.2%.

Card : 1/1

RAZUMOVSKAYA, L. N.

RAZUMOVSKAYA, L. N. -- "Formation of Buckwheat Crop Depending Upon Fertilizers, Time, and Methods of Planting." * (Dissertations For Degrees In Science and Engineering Defended At USSR Higher Educational Institutions)(30) Min Higher Education, Gor'kiy Agricultural Inst, Gor'kiy, 1955

SO: KNIZHNAYA LETOPIS' No 30, 23 July 1955

* For the Degree of Candidate in Agricultural Sciences.

29(7) PHASE I BOOK EXPLOITATION SOV/1700

Lvov. Universitet

Materialy X Vsesoyuznogo soveshchaniya po spektroskopii, 1956.
t. III: Atomnaya spektroskopiya (Materials of the 10th All-Union Conference on Spectroscopy, 1956. Vol 2: Atomic Spectroscopy)
Lvov, Izd-vo L'vovskogo univ., 1958. 568 p. (Series: Its: Fizicheskiy sbornik, vyp.4(9)) 3,000 copies printed.

Additional Sponsoring Agency: Akademiya nauk SSSR. Komissiya po spektroskopii.

Editorial Board: G.S. Landsberg, Academician, (Resp. Ed.); B.S. Neporent, Doctor of Physical and Mathematical Sciences; I.I. Fabelinskiy, Doctor of Physical and Mathematical Sciences; V.A. Fabrikant, Doctor of Physical and Mathematical Sciences; V.G. Koritskiy, Candidate of Technical Sciences; S.M. Ryavkiy, Candidate of Physical and Technical Sciences; L.K. Klimovskaya, Candidate of Physical and Mathematical Sciences; V.S. Milyanchuk (Deceased), Doctor of Physical and Mathematical Sciences; A.Ye. Gliberman, Doctor of Physical and Mathematical Sciences; M.: S.L. Gaser; Tech. Ed.: T.V. Saranyuk.

PURPOSE: This book is intended for scientists and researchers in the field of spectroscopy, as well as for technical personnel using spectrum analysis in various industries.

COVERAGE: This volume contains 177 scientific and technical studies of atomic spectrography presented at the 10th All-Union Conference on Spectroscopy in 1956. The studies were carried out by members of scientific and technical institutes and include extensive bibliographies of Soviet and other sources. The studies cover many phases of spectroscopy: spectra of rare earths, electromagnetic radiation, physicochemical methods for controlling uranium production, physics and technology of gas discharge, optics and spectroscopy, abnormal dispersion in metal vapors, spectroscopy and the combustion theory, spectrum analysis of ores and minerals, photographic methods for quantitative spectrum analysis of metals and alloys, spectral determination of the hydrogen content of metals by means of isotopes, tables, and atlases of spectral lines, spark spectrographic analysis, statistical study of variation in the parameters of calibration curves, determination of traces of metals, spectrum analysis in metallurgy, thermochemistry in metallurgy, and principles and practice of spectrochemical analysis.

Card 2/31

Materials of the 10th All-Union Conference (Cont.) SOV/1700

Card 14/31

BOCHKOVA, O.P., kand.fiz.-mat.nauk; RAZUMOVSKAYA, L.P., inzh.;
SAGAYDAK, V.G., inzh.

Photoelectric method for the determination of nitrogen in argon. Kislorod 10 no.4:24-27 '57. (MIRA 11:2)
(Nitrogen--Analysis)
(Argon--Analysis)
(Photoelectric measurements)

BOCHKOVA, O.P.; RAZUMOVSKAYA, L.P.

Spectrum analysis of multicomponent gas mixtures. Fiz.sbor. no.4:214-217 '58. (MIRA 12:5)

1. Fizicheskiy institut Leningradskogo ordena Lenina gosudarstvennogo universiteta imeni A.A.Zhdanova.
(Gases--Spectra)

SOV/51-5-1-18/19

AUTHORS: Boshkova, O.P., Kazanovskaya, L.P. and Frish, S.E.

TITLE: A Simple Method of Spectral Analysis of Purity of Inert Gases (Uproshchennyy metod spektral'nogo analiza inertnykh gazov na chistotu)

PERIODICAL: Optika i Spektroskopiya, 1958, Vol 5, Nr 1, pp 93-94 (USSR)

ABSTRACT: The authors describe a simple photoelectric method of spectral analysis which is fairly accurate and it takes only 2-3 minutes to complete. The apparatus is shown in Fig 1. The gas to be analyzed is drawn in by means of a rotary pump (N) through a vessel for removal of excess gas (S) and a furnace with a trap (F) to a discharge tube in the form of a capillary (Tr) of 1 mm diameter. Pressure in the capillary is controlled by means of a U-type manometer and taps 1 and 3. Emission of the gas in the capillary is excited using a high-frequency generator VG-2. The emission is condensed by a lens (L) on to a photomultiplier and is recorded, without amplification, by a microammeter (μA). The nitrogen bands in the region 3600 Å are separated out by a glass light-filter F. Using known mixtures a calibrating graph is obtained, in which the

Card 1/3

abscissa axis gives the concentration of nitrogen in percent and the ordinate axis gives the microammeter readings (α) which are proportional to the intensity of emission by the nitrogen bands. This method was used to determine the amount of nitrogen in argon of various degrees of purity. In technical-purity argon (with 9-15% N_2) the nitrogen bands are excited already at pressures of the order of 1-3 mm Hg. The calibration graph for these pressures is shown as curve 1 in Fig 2. Curve 2 in Fig 2 is the calibration graph for discharge-tube pressures of the order of 10 mm Hg. Pure argon should not contain more than 0.3% of N_2. In this case pressures of 100 mm Hg are necessary in the discharge tube in order to excite nitrogen bands. For argon of spectral purity (less than 0.01 % of N_2) discharge-tube pressures of several hundred mm Hg are necessary for a reliable analysis. Fig 3 shows the calibration curves for nitrogen in argon with 0.1-1% of N_2 (Fig 3a) and 0.01-0.1% of N_2 (Fig 3b). Instead of recording microammeter readings (α) which are proportional to the emission by the nitrogen bands one can use the ratio α/α_0, where α_0 is the total emission obtained without using the filter F. The

A Simple Method of Spectral Analysis of Purity of Inert Gases

ratio α/α_0 can be measured directly using the apparatus shown in Fig 4 where M is a splitting mirror FEU-1 and FEU-2 are two photomultipliers and EPP-09 is an automatic recorder. It was found that small amounts of oxygen and carbon dioxide do not affect the analysis. The method described is used for analysis of argon in the Balashikha Oxygen Plant (Ref 4). The authors thank senior laboratory assistant N.V. Chernysheva for construction of the calibration curves. There are 4 figures and 4 Soviet references.

ASSOCIATION: Leningradskiy gosudarstvennyy universitet, fizicheskiy institut (Leningrad State University, Physics Institute)

SUBMITTED: February 18, 1958

Card 3/3 1. Inert gases - Spectrographic analysis 2. Inert gases - Excitation 3. Spectroscopy - Equipment

SOV/51-5-5-22/23

AUTHORS: Bochkova, O.P., Razumovskaya, L.P. and Frish, S.E.

TITLE: Spectral Analysis of Micro-Quantities of Gas (Spektral'nyy analiz mikrokolichestv gaza)

PERIODICAL: Optika i Spektroskopiya, 1958, Vol 5, Nr 5, pp 624-626 (USSR)

ABSTRACT: In analysing very small amounts of gas the necessary pressures in the discharge tube, used to obtain the spectrum, were produced in two ways: (a) compression in a capillary using Tepler's pump, and (b) addition of an inert gas to the analysed mixture. Both these methods were employed in analysis of small amounts of air to find the proportions of oxygen, argon and nitrogen present in them. The apparatus and technique were described in Refs 5, 6. Fig 1 gives calibration curves for determination of oxygen and argon in air. Air was initially at a pressure of 10^{-4} mm Hg occupying 250 cm^3. It was compressed into a capillary of 0.5 mm diameter and emission was excited by means of a high-frequency generator. The line pair O I at 7772 Å and N I at 7468 Å was used in determination of oxygen, while the line pair A I at 7503 Å and N I at 7468 Å was used in determination of argon. The change in the amount of argon in the mixture did not affect the relative intensity of the C--I lines and consequently it did not affect the calibration graph shown in Fig 1a. Change in the oxygen concentration altered the relative

Card 1/3

Spectral Analysis of Micro-Quantities of Gas

intensity of the A--N lines, leading to a parallel displacement of the calibration lines shown in Fig 1b. The mean error in determination of oxygen was 15% and in determination of argon was 8%. Employing the second method the authors used helium as an inert gas diluent, since helium has the highest excitation potential of all gases. Addition of helium considerably increases the total mass of gas used in the analysis, and minimizes the effects due to sorption and desorption of gas by the discharge-tube walls. This improves the precision of the analysis. To the original amount of air (at 10^{-4} mm Hg pressure in a volume of 250 cm^3) 3, 5, 10, 100 times that amount of helium was added. Better reproducibility is obtained when the amount of helium added is five times the original amount of air. The error in determination of oxygen is then lowered to 10-12% and the error in determination of argon decreases to 5%. Addition of helium in amounts of 100 and more times the original amounts of gas to be analysed makes it possible to make a quantitative spectral analysis of amounts of the order of 0.01 mm^3 at atmospheric pressure. Fig 2 gives calibration curves for analysis of argon and oxygen in air (3×10^{-5} mm Hg pressure in a volume of 250 cm^3)

Spectral Analysis of Micro-Quantities of Gas

with helium added in the proportion of 80:1. On addition of helium a change in the oxygen concentration does not affect the calibration curves for argon but the error in determination of argon increases to 20%. This is because the partial pressure of argon in such a mixture is very small. There are 2 figures and 8 references, 4 of which are Soviet, 3 German and 1 other.

SUBMITTED: June 24, 1958

Card 3/3 1. Gases--Quantitative analysis 2. Gases--Spectra 3. Oxygen --Determination 4. Nitrogen--Determination 5. Argon--Determination

24(7), 5(2) SOV/51-6-6-25/34

AUTHORS: Bochkova, O.P., Razumovskaya, L.P., Frish, S.E. and Chernysheva, N.V.

TITLE: Simple Methods of Spectral Analysis of Inert Gases for Impurities (Uproshchennyye metody spektral'nogo analiza inertnykh gazov na primesi)

PERIODICAL: Optika i spektroskopiya, 1959, Vol 6, Nr 6, pp 818-820 (USSR)

ABSTRACT: The authors described earlier (Ref 3) a simple method of spectroscopic determination of the nitrogen content of argon, suitable for use under industrial conditions. The spectral instrument was replaced by a filter which separated out the required part of the spectrum. The discharge was excited in a capillary by a high-frequency oscillator and argon was drawn continuously through the capillary by means of a mechanical pump. Emission proportional to the amount of nitrogen was recorded by means of a photomultiplier FEU-19 connected to a microammeter. The sensitivity of the method was 0.01% and its precision ~10%. This simple method of analysis was applied also to determination of the amount of hydrogen in helium, neon in helium and neon-helium mixture in nitrogen. A table on p 820 gives the range of impurity concentrations which could be measured, the filters and the receivers used as well as the diameters of the capillary and pressures in it. Since only small amounts of the gases were available the discharge tubes used in the investigation reported here had capillaries closed at one end; such a capillary is denoted by

Card 1/2

Simple Methods of Spectral Analysis of Impurities in Inert Gases

3 in Fig 2 (1 and 2 are electrodes). The discharge was excited by one of the following: (1) an oscillator VG-2, (2) a low-power oscillator based on the GU-29 tube and whose working frequency was 30 Mc/s, (3) a pulse magnetron which produced 3 cm waves. The reproducibility of the results was 5-6% when (2) or (3) were used but it fell to ~10-15% when the oscillator VG-2 was employed. To construct calibration curves (microammeter current v. concentration, Fig 1) the authors used standards in the form of mixtures of known compositions. There are 2 figures, 1 table and 3 Soviet references.

Card 2/2

S/051/60/009/002/005/006
E201/E691

AUTHORS: Razumovskaya, L.P. and Bochkova, O.P.

TITLE: Optical and Electrical Properties of "Strong" and "Weak" High-Frequency Discharges in Neon

PERIODICAL: Optika i spektroskopiya, 1960, Vol. 9, No. 2, pp. 271-273

TEXT: The authors report a study of two stable forms ("strong" and "weak") of a 6 Mc/s discharge in neon. Neon was placed in a cylindrical tube (12 mm diameter and 150 mm length) with external ring-shaped electrodes 70 mm apart. The two forms of the discharge were possible only at pressures of p = 0.2-0.3 mm Hg. Fig. 1 (curves 1) shows that the electron temperature T_e was independent of the voltage applied to the discharge tube, but was different for the two forms of the discharge: 67 000°K in the "strong" case and 81 000°K in the "weak" case. In both cases the electron density (Fig. 1, curves 2) was of the order of 10^9-10^{10} cm^{-3} and rose linearly with the tube voltage. The electron density, however, was higher in "strong" discharges. Although the total luminance of the "strong" discharge was considerably greater than that of the "weak" one, in both cases only arc

S/051/60/009/002/005/006
E201/E691

Optical and Electrical Properties of "Strong" and "Weak" High-Frequency Discharges in Neon

lines were excited in the positive column. The measured relative intensities of the 4712, 4704, 4708, 5330, 5341, and 5400 Å lines (the 4712 Å line intensity was taken to be unity) are listed in Table 1; they were obtained at a tube voltage of 1100 V and p = 0.2 mm Hg. Fig. 2 gives the dependence of the relative spectral line intensities on the tube voltage, with and without allowance for reabsorption. Reabsorption of lines ending at the $3P^0_{0,\,1,\,2}$ levels was considerably greater in "strong" discharges than in "weak" ones. Concentrations of the excited atoms at the $3P^0_{0,\,1,\,2}$ and $1P^0_0$ levels, deduced from measurements of reabsorption, are listed in Table 2 for p = 0.2 mm Hg and a tube voltage of 1000 V; these concentrations were 3-4 times greater in "strong" discharges than in "weak" ones. It was concluded that the optical differences between "strong" and "weak" discharges were related primarily to the differences in the electron densities. The

Card 2/3

S/051/60/009/002/005/006
E201/E691

Optical and Electrical Properties of "Strong" and "Weak" High-Frequency Discharges in Neon

authors suggested that in high-frequency spectrochemical analysis "weak" discharges may be used to increase the concentration sensitivity. Acknowledgments are made to S.E. Frish and Yu.M. Kagan for their help and advice. There are 2 figures, 2 tables and 5 references: 4 Soviet and 1 English.

SUBMITTED: March 25, 1960

Card 3/3

USTINOV, V.B., BOCHKOVA, O.P., RAZUMOVSKAYA, L.P.

Low-power high frequency generator for use in the spectrum analysis of gases. Zav.lab. 26 no.5:621-622 '60.
(MIRA 13:7)

1. Leningradskiy gosudarstvennyy universitet im. A.A. Zhdanova.
(Gases--Spectra)

BOCHKO[illegible], G.L.; KOZUMOVSKAYA, L.P.

Spectroscopic studies of high-frequency discharges in helium.
Opt. i spektr. 18 no.5:777-784 My '65.
(MIRA 18:10)

L 1683-66 EWT(1)/EPA(s)-2/EPA(w)-2/EWA(m)-2

ACCESSION NR: AT5010025 GE/0000/62/000/000/0379/0387

AUTHOR: Bochkova, O. P.; Razumovskaya, L. P.; Frish, S. E.

TITLE: Spectrographic analysis of a high frequency discharge in neon

SOURCE: Physikalische Gesellschaft in der Deutschen Demokratischen Republik. Tagung, Jena, 1960. Optik und Spektroskopie aller Wellenlangen (Optics and spectroscopy of all wave lengths); Tagung der Physikalischen Gesellschaft in der DDR. Berlin, A-V, 1962, 379-387

TOPIC TAGS: neon, gas discharge spectroscopy, line spectrum, line intensity, electron energy level

ABSTRACT: The optic and electrical characteristics of an electrodeless high frequency discharge in neon are studied using radiation reabsorption and the two-probe method. Two molybdenum glass discharge tubes were used--one 12 mm in diameter and 150 mm long, the other 60 mm in diameter and 300 mm long. High frequency voltage was fed from a 6 Mc HF generator with a power of ~350 watts to the external electrodes of the discharge tube. Two molybdenum probes were sealed into the 12 mm tube at the center along the axis. These probes were 0.2 mm in diameter and 5 mm long. The distance between the probes was 15 mm. Data were also obtained on the

Card 1/2

L 1683-66

ACCESSION NR: AT5010025

population of the lower $2p^5 3s {}^3P_{0,1,2}$, $^1P_1$ and $2p^5 3pY$ levels in neon as a function of pressure (in the 0.5-7 mm Hg range) and as a function of electron concentration. Reabsorption measurements were made across the emitting column in the 12 mm tube and along the column in the 60 mm tube. It was found that the maximum population for $2p^5 3s {}^3P_{0,1,2}$ levels lies at a pressure of approximately 1.3 mm Hg, while the maximum for $2p^5 3pY$ levels is situated at a higher pressure (2-3 mm Hg). When the concentration of electrons is varied within small limits, an increase is observed in the concentration of excited atoms on all levels. A further increase in the concentration of electrons leads to an extremely flat maximum in the concentration of excited atoms. The relative line intensity varies considerably with pressure. When the pressure is increased, there is a sharp reduction in the intensity of lines where $2p^5 3p {}^1S_0$ is the upper level. When the lines have upper levels which are lower than this, the intensity maxima lie at pressures in the 1.5-4 mm Hg range. Lines whose upper levels correspond to the $2p^5 4d$ and higher configurations have very low intensities. Orig. art. has: 4 figures.

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: ME, OP

NO REF SOV: 009 OTHER: 006

Card 2/2 OP

L 64510-65 EPF(c)/EPA(s)-2/EPA(w)-2/EWT(l)/EWT(m)/EWP(b)/EWA(m)-2/EWP(t) IJP(c) JD

ACCESSION NR: AP5012603 UR/0051/65/018/005/0777/0784
537.523.527:548.294

45
42
B

AUTHORS: Bochkova, O.P.; Razumovskaya, L. P.

TITLE: Spectroscopic investigation of a high-frequency discharge in helium

SOURCE: Optika i spektroskopiya, v. 18, no. 5, 1965, 777-784

TOPIC TAGS: gas discharge, high frequency discharge, helium, excited state, pressure effect

ABSTRACT: This is a continuation of earlier investigations of high-frequency discharges in neon and argon (Opt. i spektr. v. 11, 697, 1961 and v. 14, 189, 1963). The present investigation is devoted to discharge in helium as a function of the excitation conditions (gas pressure, diameter of discharge tube, and high-frequency voltage on the electrodes). The measurements were carried out in cylindrical molybdenum-glass discharge tubes of 3 -- 60 mm in diameter and 120 -- 750 mm long. A VG-2 generator operating at a constant frequency of

Card 1/3

L 64510-65

ACCESSION NR: AP5012603

6 Mcs and a constant rating 150 watts was used for the excitation. The pressure interval from 0.1 to 7 mm Hg was studied. The concentration of the excited atoms was determined by reabsorption and radiation methods. The concentration measurements were accompanied by measurements of the electron temperature and the electron density. The results show that the plots of the excited-helium-atom concentration vs. pressure show the same maximum as in the case of neon and argon. The variation of the concentration of the exciting atoms has a characteristic nonmonotonic variation with the density, and relatively large populations of the n^3P, small concentrations of the n^1P levels, and some population inversions are observed. The relative roles of the elementary processes in the population and in the deterioration of the excited states of helium are estimated on the basis of the results, within the framework of the existing notions concerning the gas-discharge radiation mechanism. The numbers of direct and stepwise acts of population of the upper levels per unit time and per unit volume, as well as the numbers of the quanta emitted from these levels and the calculated and experimental values of the

Card 2/3

L 64510-65

ACCESSION NR: AP5012603 3

concentrations of the excited atoms, are tabulated for all the energy levels. 'The authors are deeply to S. E. Frish for a discussion of the results.' Orig. art. has: 4 figures, 2 formulas, and 3 tables.

ASSOCIATION: None

SUBMITTED: 22Apr64 ENCL: 00 SUB CODE: OP

NR REF SOV: 014 OTHER: 007

Card 3/3

ACCESSION NR: AP4042977 S/0051/64/017/001/0016/0023

AUTHORS: Bochkova, O. P.; Razumovskaya, L. P.

TITLE: Spectroscopic investigation of 'weak' and 'strong' high frequency discharges in noble gases

SOURCE: Optika i spektroskopiya, v. 17, no. 1, 1964, 16-23

TOPIC TAGS: high frequency discharge, inert gas, helium, neon, argon, electron temperature, excited state, electron concentration

ABSTRACT: Following earlier studies of the jumplike discontinuity existing in a high-frequency low-pressure discharge in noble gases, between the so-called "weak" and "strong" discharges (Opt. i spektr. v. 9, 271, 1960 and v. 15, 716, 1964), the authors investigated the glow produced by both types of discharge near the discontinuity region. They measured the electron temperatures and the excited-atom concentrations as functions of the initial pressure, the discharge-

Card 1/7

ACCESSION NR: AP4042977

tube diameter, and the electron concentration in the discharge. The test setup is described. The excited atom concentrations were calculated for a large number of levels of helium, neon, and argon from the experimentally measured electron temperatures and concentrations and the results compared with the experimental data. For the higher levels, the experimental data differ from the calculated values by one or two orders of magnitude, although in some cases the discrepancy is not as large. The discrepancy can be eliminated by assuming that the upper levels disintegrate as a result of collisions with normal atoms. The results are used to propose a mechanism for the population and disintegration of the excited states of these gases in the discontinuity region. This mechanism is connected in the case of helium with population of the upper levels as a result of the decay of ionic-molecular compounds. "The authors are deeply grateful to S. E. Frish for numerous discussions of the results." Orig. art. has: 2 figures, 8 formulas, and 5 tables.

Card 2/ 2

ACCESSION NR: AP4042977

ASSOCIATION: None

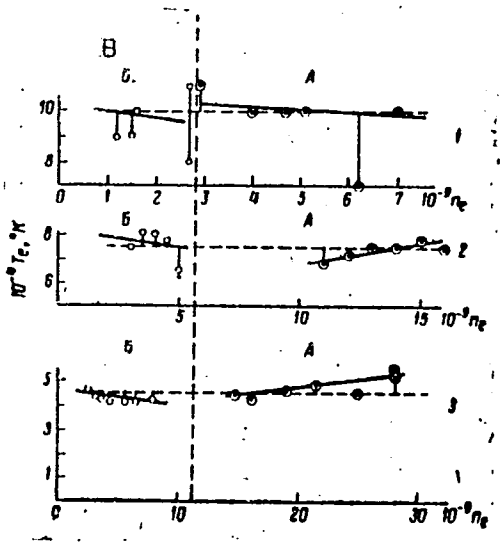
SUBMITTED: 17Jul63 ENCL: 04

SUB CODE: NP, OP NR REF SOV: 018 OTHER: 011

Card 3/7

ACCESSION NR: AP4042977

ENCLOSURE: 01

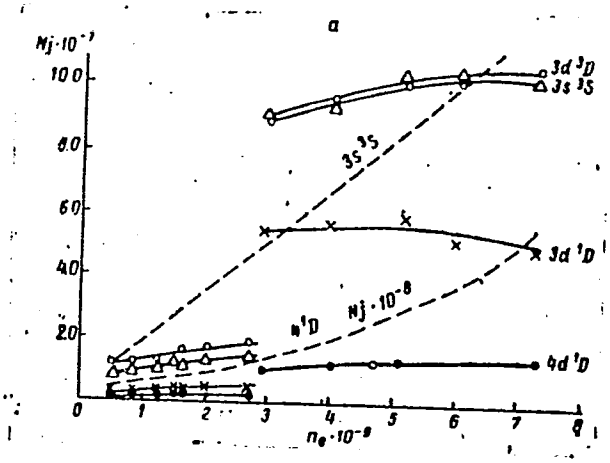


Dependence of electron temperature on the electron density in 'strong' (A) and 'weak' discharges in helium (1), neon (2), and argon (3)

Card 4/4

ACCESSION NR: AP1042977

ENCLOSURE: 02

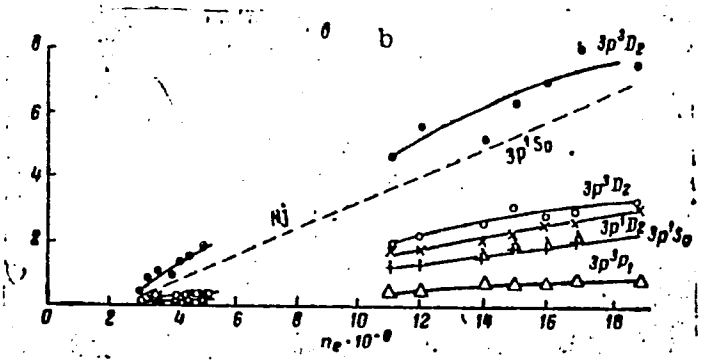


(continued in enclosure #3)

Card 5/7

ACCESSION NR: AP4042977

ENCLOSURE: 03

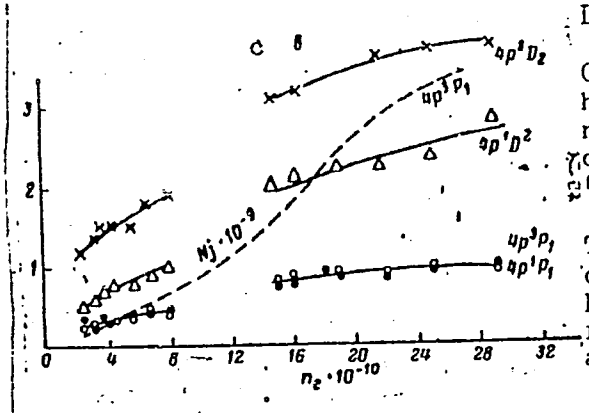


(continuation of enclosure #2)

Card 6/7

ACCESSION NR: AP4042977

ENCLOSURE: 04



Legend for Encl. 02 and 03 and 04 :

Concentration of excited atoms on the high-energy levels in helium (a), neon (b), and argon (c) vs. the concentration of the electrons in 'weak' and 'strong' discharges

The dashed lines show the calculated curve for one of the levels of Ne, He, and Ar. At low electron concentrations, left -- 'weak discharge; at high concentration, right - 'strong' discharge

7/7

Card

BOCHKOVA, O.P.; RAZUMOVSKAYA, L.P.

Spectroscopic observation of an unstable region in the transition from a "weak" to a "strong" high-frequency discharge. Opt. i spektr. 15 no.5:716-718 N '63. (MIRA 16:12)

RAZUMOVSKAYA, L.P.

Spectroscopic study of a high-frequency discharge in argon. Opt. i spektr. 14 no.2:189-198 F '63. (MIRA 16:5)
(Electric discharges through gases) (Spectrum analysis)

S/051/63/014/002/003/026
E032/E114

AUTHOR: Razumovskaya, L.P.

TITLE: A spectroscopic study of high frequency discharge in argon

PERIODICAL: Optika i spektroskopiya, v.14, no.2, 1963, 189-198

TEXT: The aim of this work was to investigate the dependence of the concentration of excited argon atoms on the discharge conditions. The experimental work was carried out using re-absorption and emission methods. In addition, two probes were used to determine the electron temperature and concentration. The apparatus was essentially the same as that described earlier (O.P. Bochkova, L.P. Razumovskaya and S.E. Frish, Opt. i spektr., v.11,1961, 697). The measurements were carried out at a frequency of 6 Mc/sec. The sum rule was used to estimate the absolute value of the oscillator strength for the 8115 Å line of Ar I ($1s_5 - 2p_9$). The result was $f_{8115} = 0.5$. This was then used to determine the oscillator strengths for 24 lines of Ar I in the infrared and visible ranges. The absolute oscillator strengths

Card 1/3

were then employed to determine the concentration of excited argon atoms. A study was also made of the effect of the voltage applied to the tube on the level population in the range 600 - 500 V for the levels $3p^5 4sY$, $3p^5 4pZ$ and $3p^5 5pX$, and of the effect of pressure on the concentration of excited argon atoms. The results obtained are given in detail in numerical tables. The thermodynamic equilibrium was found to be absent in the argon discharge. The absolute values of the concentration of excited atoms turned out to be lower by three or four orders of magnitude than the Boltzmann concentrations calculated from the electron temperature. In the case of a 4 cm diameter discharge tube and a pressure of 0.6 mm Hg, the concentration of excited atoms was proportional to n_e and $an_e + bn_e^2$ for the $3p^5 4sX$ and $5p^5 4pY$ levels respectively. When the diameter of the discharge tube was reduced to 1.2 cm, the electron temperature and the density were considerably increased, and the concentration of excited atoms in the $3p^5 4sX$ state eventually reached a saturation value. When the diameter was reduced still further (to 0.3 cm) the concentration was considerably

reduced due to the increase in the probability of ionization of excited atoms as a result of electron collisions of the second kind, and to the higher efficiency of stepwise excitation of higher-order configurations.
There are 3 figures and 4 tables.

SUBMITTED: March 20, 1962

BOCHKOVA, O.P.; RAZUMOVSKAYA, L.P.; FRISH, S.E.

Spectroscopic study of a high-frequency discharge in neon. Opt. i spektr. 11 no.6:697-705 D '61. (MIRA 14:11)
(Neon)
(Electric discharges through gases)

S/051/61/011/006/001/012
E039/E385

AUTHORS: Bochkova, O.P., Razumovskaya, L.P. and Frish, S.E.

TITLE: Spectroscopic investigations of high-frequency discharges in neon

PERIODICAL: Optika i spektroskopiya, v.11, no.6, 1961, 697-705

TEXT: High-frequency discharges in gases are widely used as light sources for various optical investigations and for spectral analysis. This paper describes a detailed investigation of this type of discharge. Radiation re-absorption and double-probe methods were used to determine the optical and electrical characteristics of an electrodeless high-frequency discharge in neon. The discharges were produced in tubes of 3.5, 12, 40 and 60 mm in diameter and 150 - 300 mm in length. The high-frequency voltage was supplied to external electrodes from a 6 Mc/s, 350 W generator. The tubes were evacuated by a fully trapped high-vacuum system. Natural neon, containing not more than 0.3% helium, was used. Other impurities (O_2, H_2, N_2) did not exceed 10^{-3}%. The spectroscopic observations were made in the visible (red) part of the spectrum and data produced on the population

Card 1/3

levels $2p^5 3sX$ and $2p^5 3pY$ in neon. The probes used consisted of molybdenum wire 0.2 mm diameter and 5 mm long sealed into the glass. Electron temperatures T_e were found from the probe characteristics by the method of E.O. Johnson, L. Malter (Ref. 12: Phys. Rev., 80, 58, 1950) and the electron density n_e from the formula of Yu.M. Kagan and V.I. Perel (Ref. 13: DAN SSSR, 91, 1321, 1953). The dependence of electron temperature and density on tube diameter, gas pressure and HF power was determined. The highest values of n_e and T_e were obtained in the 3.5 mm diameter tube in which $n_e = 12 \times 10^{-11}$ and $T_e = 10[illegible] \times 10^{[illegible]}$ at a pressure of 1.[illegible] mm Hg and fell rapidly as the tube diameter was increased to values of $n_e = 2 \times 10^{-11}$ and $T_e = 20 \times 10^3$ for the 60-mm diameter tube. The highest values of T_e were obtained at low pressures ranging from

Card 3/7

Spectroscopic investigations ...

T_e = 100 x 10^{-3} at 1.5 mm to 45 x 10^{-3} at 6 mm, the electron density n_e, however, is effectively directly proportional to pressure. It is shown that T_e is practically independent of the high-frequency power input while n_e is directly proportional to it. Comparison is made with DC discharges and it is shown that higher values of T_e are obtained in the HF discharge. It is shown that the conditions in a HF discharge are easily varied over a wide range by changing-pressure, power input and diameter of tube, hence making it a very suitable source for all spectral analysis problems. A.A. Zaytsev and Ye.N. Yankovskaya are mentioned in the article for their contributions in this field. There are 9 figures and 20 references: 12 Soviet-bloc and 8 non-Soviet-bloc. The four latest English-language references mentioned are: Ref. 2: A.T. Forrester, K.A. Gundmundsen P.C. Johnson - J. Opt. Soc. Amer. 46, 339, 1956; Ref. 6: J.A. Harrison - Proc. Phys. Soc., 73 841, 1959; Ref. 12 mentioned in text, Ref. 19: A.V. Phelps, Phys. Rev., 99 1657, 1955.

SUBMITTED March 16, 1961

RAZUMOVSKAYA, L.P.; BOCHKOVA, O.P.

Optical and electrical properties of "weak" and "strong" highfrequency discharges in neon. Opt. i spektr. 9 no.2:271-273 Ag '60. (MIRA 13:8)

(Electric discharges in gases)

RAZUMOVSKAYA, L.V.; KURENKOV, V.P.

Simplified method for the analysis of contact gases from butylene dehydration. Khim. prom. 41 no. 12:928-929 D '65. (MIRA 19:1)

LIAKUMOVICH, A.G.; ZAKHAROVA, N.V.; LAPKIN, L.M.; ANDREYEVA, L.N.; RAZUMOVSKAYA, L.V.; UVAROVA, Ye.D.; VOLOSHKO, S.G.

Chromatographic analysis at the Sterlitamak Plant of Synthetic Rubber. Zav.lab. 28 no.5:637 '62. (MIRA 15:6)

1. Sterlitamakskiy zavod sinteticheskogo kauchuka.
(Sterlitamak--Rubber, Synthetic) (Chromatographic analysis)

RAZUMOVSKAYA, M.R.

Study of a wave flow under $i_o \gg i_{kp}$ conditions. Trudy Gruz NIIGiM no.21:177-182 '60. (MIRA 16:1)
(Waves)

RAZUMOVSKAYA, M.R.

Calculations for chutes of increased roughness. Trudy GruzNIIGiM no.20:255-259 '58. (MIRA 15:5)

(Canals)

RAZUMOVSKAYA, N.A., dotsent, kand.biologicheskikh nauk

Influence of silicon compounds on the condition of the cholesterol-protein complexes in the animal organism. Sbor. rab. po silik. no.2:203-212 '60. (MIRA 14:3)

1. Sverdlovskiy gosudarstvennyy meditsinskiy institut.
(SILICON--PHYSIOLOGICAL EFFECT)
(CHOLESTEROL METABOLISM) (PROTEINS IN THE BODY)

GAYTSHOKI, V.S.; RAZUMOVSKAYA, N.I.

Nucleic acids. Vop. med. khim. 8 no.6:651-652 N-D '62. (MIRA 17:5)

5347. **Abolition by anserine of action of poisons on oxidative metabolism of muscle tissue.** S. E. Severin, N. P. Meshkova, and N. I. Razumovskaia. *Dokl. Akad. Nauk. S.S.S.R.*, 1955, **103**, 871–874; *Referat. Zh. biol. Khim.*, 1956, Abstr. No. 17576.—200–300 mg of [illegible] breast muscle were incubated 50 min. at 20° with phosphate buffer (KCl, KCl, $MgSO_4$, Na_2HPO_4) with creatine as phosphate acceptor. Respiration was recorded manometrically and phosphorylation by increase of labile P. 1×10^{-4}–3×10^{-4} M cyanide reduced the rate of respiration; the ratio P : O remaining practically unchanged. Anserine (20 mg. per test) in the presence of cyanide [illegible] the esterification of P, this increase being proportional to the magnitude of the residual respiration, and P : O remaining practically the same as with cyanide alone. Carnosine with cyanide does not raise the esterification. 5×10^{-4} M azide does not affect respiration, but sharply inhibits phosphorylation. Anserine [illegible] abolishes the effect of azide and restores the ratio P : O [illegible] to the value characteristic of the stimulating action of [illegible] alone in control experiments without azide. Carnosine and histidine also restore, but to a lesser degree than anserine, the P : O ratio with azide; β-alanine was without effect. Anserine does not abolish the inhibitory action of 2×10^{-4} M dinitrophenol on phosphorylation. In the presence of the latter it [illegible]

[illegible] only that [illegible] of the phosphorylation that is not abolished by dinitrophenol. (Russian)

T. R. Parsons

SOV/124-58-7-7633

Translation from: Referativnyy zhurnal, Mekhanika, 1958, Nr 7, p 43 (USSR)

AUTHOR: Razumovskaya, M.R.

TITLE: On an Experimental Study of the Wave Formation and Aeration of the Water Occurring in Chute-type Spillways (K voprosu eksperimental'nogo izucheniya volnoobrazovaniya i aeratsii na bystrotokakh)

PERIODICAL: Tr. Gruz. n.-i. in-ta gidrotekhn. i melior., 1957, Nr 18-19, pp 237-252

ABSTRACT: Bibliographic entry

1. Inland waterways--Analysis 2 Water waves--Development 3. Dams --Applications 4. Mathematics--Applications

Card 1/1

RAZUMOVSKAYA, M.R., inzhener.

Wave formation in chute spillways. Gidr.stroi. 26 no.8:45-48 Ag '57.
(MIRA 10:10)
(Spillways)

RAZUMOVSKAYA, N.I. (Belyayeva)

Mechanisms of regulation of glucoso-6-phosphate metabolism in skeletal muscles. Biokhimiia 30 no. 3:499-504 My-Je '65 (MIRA 19:1)

1. Otdel biokhimii Instituta eksperimental'noy meditsiny AMN SSSR, Leningrad.

SEVERIN, S.Ye.; MESHKOVA, N.P.; RAZUMOVSKAYA, N.I.

Neutralization with anserine of the effect of poisons on oxidation metabolism in muscle tissue. Dokl.AN SSSR 103 no.5:871-874 Ag '55. (MLRA 9:1)

1.Chlen-korrespondent AN SSSR (for S.Ye.Severin).2.Moskovskiy gosudarstvennyy universitet imeni M.V.Lomonosova.

(MUSCLES, effect of drugs on,
anserine, on resp. & phosphorylation after interference with poisons)
(ANSERINE, effects,
on musc. resp. & phosphorylation after interference with poisons)
(PHOSPHORUS, metabolism,
musc., eff. of anserine on phosphorylation after interference with poisons)

PROTSENKO, P.I.; RAZUMOVSKAYA, O.N.

Viscosity of eutectic melts of some ternary nitrate and nitrite systems. Zhur.fiz.khim. 38 no.11:2680-2681 N '64. (MIRA 18:2)

1. Rostovskiy-na-Donu gosudarstvennyy universitet.

PROTSENKO, P.I.; RAZUMOVSKAYA, O.N.

Internal friction of fused univalent metal nitrates. Zhur. prikl. khim. 38 no. 10:2355-2358 O '65. (MIRA 18:12)

1. Rostovskiy gosudarstvennyy universitet. Submitted Sept. 13, 1963.

PROTSENKO, P.I.; RAZUMOVSKAYA, O.N.; IVANOVA, Ye.M.

Some physicochemical properties of solutions of the KNO_2 - $Ba(NO_2)_2$ - H_2O system. Izv.vys.ucheb.zav.; khim.i khim.tekh. 8 no.4:696-701 '65. (MIRA 18:11)

1. Rostovskiy-na-Donu gosudarstvennyy universitet, kafedra obshchey i neorganicheskoy khimii.

L 48588-65 EPA(s)-2/EWT(m)/EPF(c)/EPF(n)-2/EPR/T/EWP(t)/EWP(b) Pr-4/Ps-4/
~~Pt-7/Pu-4 IJP(c) JD/WW/JG~~
ACCESSION NR: AP5009945 UR/0078/65/010/004/0751/0754

AUTHOR: Protsenko, P. I.; Protsenko, A. V.; Razumovskaya, O. N.

TITLE: Internal friction in melts of alkali metal nitrites

SOURCE: Zhurnal neorganicheskoy khimii, v. 10, no. 4, 1965, 751-754

TOPIC TAGS: fused salt, alkali metal nitrite, melt viscosity, complex ion, internal friction

ABSTRACT: Internal friction in melts of lithium-, sodium-, calcium-, potassium-, rubidium-, and cesium nitrites was studied within the limits of thermal stability. No general quantitative theory of viscosity of fused salts is developed as yet. Knowledge of viscosity of fused salts is of practical importance in nuclear energetics, thermal working of metals, heat transfer, heat resistant lubrication, etc. The viscosity (η) of melts of alkali metal nitrites was found to be a linear inverse function of temperature. At temperatures approximately five percent above the respective melting points lithium nitrite exhibits the highest viscosity among the melts of alkali metal nitrites. Applicability of the equation $\eta = A \cdot e^{\Delta U/RT}$ to

Card 1/2

L 48583-65

ACCESSION NR: AP5009945

melts of alkali metal nitrites is shown and the activation energies of viscous flow ($\Delta E\eta$) are determined. Within the studied temperature range the values of $\Delta E\eta$ are proportional to the values of activation energy of electrical conductivity (ΔE_χ). High values of $\Delta E\eta$ and low ratios of $\Delta E\eta$ to ΔE_χ indicate formation of relatively stable complex ions in melts of alkali metal nitrites. Orig. art. has: 3 figures, 2 tables.

ASSOCIATION: Rostovskiy-na-Donu gosudarstvenny'y universitet (Rostov State University)

SUBMITTED: 12Oct63 ENCL: 00 SUB CODE: GC

NO REF SOV: 006 OTHER: 008

Card 2/2

RAZUMOVSKAYA, R.I.

BUSHUYEV, A.K.; TABUNOV, K.A.; LEVIT, Yu.L.; BRESKIN, P.P.; URIN, L.I.; RAZUMOVSKAYA, R.I.; CHERNOUS, V.A.

Organizing production quality control. Metallurg 3 no.3:32-34 Mr '58. (MIRA 11:3)

1. Otdel tekhnicheskogo kontrolya Nizhne-Tagil'skogo metallurgicheskogo kombinata (for Bushuyev, Tabunov, Levit). 2. Nachal'nik otdela tekhnicheskogo kontrolya Dnepropetrovskogo zavoda im. Lenina (for Breskin). 3. Starshiy inzhener OOT Dnepropetrovskogo zavoda im. Lenina (for Urin). 4. Nachal'niki uchastkov otdela tekhnicheskogo kontrolya zavoda "Zaporozhstal' " (for Razumovskaya, Chernous).
(Metalwork--Quality control)

130-3-18/21

AUTHOR: [illegible], R. I. and Chernous, V.A., Section Heads of OTK

TITLE: Not given.

PERIODICAL: Metallurg, 1958, No.3, p.34 (USSR).

ABSTRACT: The authors discuss experience at the "Zaporozhstal'" Works in the curtailment of the technical quality control department's operations. They indicate that difficulties arose at these works through the mixing up of different types of steel when controllers were eliminated and stress the need for controllers in all operations where this is possible. They urge research organisations to develop methods of avoiding the mixing of steels and of automating and mechanizing the measurement of dimensions.

ASSOCIATION: "Zaporozhstal'" Works.

AVAILABLE: Library of Congress.

Card 1/1

TEMNIKOVA, T.I.; YERSHOV, B.A.; ARDITI, A.I.; RAZUMOVSKAYA, R.N.

Interaction of α-oxybromides with Na derivatives of β-dicarbonyl compounds. Zhur.ob.khim. 33 no.10:3436-3437 O '63. (MIRA 16:11)

1. Leningradskiy gosudarstvennyy universitet.

RAZUMOVSKAYA, S. [Razumouskaia, S.] , mastatsveznautsa

Dresses for aged women. Rab. i sial. 34 no.2:24-3 of cover '58.
(MIRA 11:2)

(Clothing and dress)

RAZUMOVSKAYA, S. G.

"Influence of Ethyl Alcohol on the Oxidation of Sorbite into Sorbose in the Synthesis of Ascorbic Acid," Mikrobiol., 14, No. 1, 1945. Mbr., Microbiological Lab., Leningrad State Univ. im. -1945-.

SKLYAROVA, V.K., otv. red.; ARALOVA, V.I., red.; VOL'MAN, V.K., red.; DERZHAVIN, B.A., red.; IVANOVA, V.A., red.; KOMAROVA, V.R., red.; KULICHEV, A.F., red.; MAKAROVA, N.S., red.; NARODETSKIY, red.; PROKOF'YEVA, T.I., red.; PROZOROVA, T.A., red.; RAZUMOVSKAYA, S.V., red.; RODIONOV, V.A., red.; SURGUNOVA, N.S., red.; KHVOSTOV, V.V., red.; KLEYMENOVA, T.A., tekhn. red.

[Men's clothing] Muzhskaia odezhda. Moskva, 1961. 27 p. (MIRA 15:2)

1. Russia (1923- U.S.S.R.) Gosudarstvennaya planovaya kommissiya. Vsesoyuznyy institut assortimenta izdeliy legkoy promyshlennosti i kul'tury odezhdy.
(Men's clothing)

KALLOTKAYA, S. V.

SKLYAROVA, V.K., otvetstvennyy redaktor; SHESTAKOV, V.A., redaktor; ARALOVA, V.I., redaktor; RAZUMOVSKAYA, S.V., redaktor; TIMCHENKO, P.I., redaktor; TURCHANOVSKAYA, L.P., redaktor; GOLIKOVA, N.A., redaktor; SARKISYAN, P.A., redaktor; SHTERENBERG, A.P., redaktor; MEDVEDEVA, L.A., tekhnicheskiy redaktor.

[Children's clothes] Detskaia odezhda. Moskva, [Izd.Gos.nauchno-tekhn.izd-va M-va legkoi promyshl.SSSR] 1957. 64 p. , 1 fold.pattern. (MLRA 10:5)

(Clothing and dress)

SAFARYAN, Misak Karapetovich; ASHKINAZI, Mikhail Isayevich; CHOLOYAN, Genrik Saakovich; RAZUMOVSKAYA, T.Ya., red.; DEMIDOV, Ya.F., tekhn. red.

[Steel tanks with spherical cylindrical roofs for petroleum products; experimental and theoretical studies of the construction]Stal'nye rezervuary so sferotsilindricheskoi krovlei dlia nefteproduktov; eksperimental'nye i teoreticheskie issledovaniia konstruktsii. Moskva, VNIIST Glavgaza SSSR. Redaktsionno-izdatel'skii ot-del, 1961. 94 p. (MIRA 15:11)
(Tanks)

IDASHKIN, S.I., kand. tekhn. nauk; IVANOVA, K.Ye., inzh.;
PROKOF'YEV, V.I., red.; RAZUMOVSKAYA, T.Ya., red.;
DEMIDOV, Ya.F., tekhn. red.

[Collection of abstracts of research work conducted during 1960 and 1961] Sbornik annotatsii nauchno-issledovatel'skikh rabot za 1960-1961 gg. Pod red. V.I.Prokof'eva. Moskva, 1962. 57 p. (MIRA 17:3)

1. Moscow. Vsesoyuznyy nauchno-issledovatel'skiy institut po stroitel'stvu magistral'nykh truboprovodov.

PROKOF'YEV, V.I., kand. tekhn. nauk, red.; RAZUMOVSKAYA, T.Ya., red.

[Collection of annotations of scientific and research work carried out in 1962] Sbornik annotatsii nauchno-issledovatel'skikh rabot za 1962 g. Moskva, TSentr. nauchno-tekhn. informatsii Gos. proizvodstvennogo kom-ta po gazovoi promyshl. SSSR, 1963. 71 p. (MIRA 17:10)

1. Moscow. Vsesoyuznyy nauchno-issledovatel'skiy institut po stroitel'stvu magistral'nykh truboprovodov.

REYTLINGER, Sergey Aleksandrovich; CHEKHOVSKIY, Yuriy Vasil'yevich; MOSKALEV, N.S., kand. tekhn.nauk, retsenzent; REBINDER, P.A., akademik, red.; VAYNER, M.S., red.; RAZUMOVSKAYA, T.Ya., red.; DEMIDOV, Ya.F., tekhn. red.

[Mechanisms of the transmission of gases and liquids through concrete and methods of studying the structure of concrete pores]Mekhanizmy perenosa gazov i zhidkostei cherez beton i metody issledovaniia struktury por betona. Pod red. P.A. Rebindera. Moskva, VNIIST Glavgaza SSSR. Red.-izdatel'skii otdel, 1961. 63 p. (MIRA 15:11)
(Concrete--Testing)

MAZEL', Aleksandr Grigor'yevich; ROGOVA, Yelena Mikhaylovna; SOROKIN, Lev Ivanovich; RAZUMOVSKAYA, T.Ya., red.; DEMIDOV, Ya.F., tekhn.red.

[Research on new electrodes for the welding of pipes and other structures made of low-carbon and low-alloy steels] Issledovanie novykh elektrodov dlia svarki truboprovodov i drugikh konstruktsii iz malouglerodistoi i nizkolegirovannoi stali. Moskva, VNIIST Glavgaza SSSR, redaktsionno-izdatel'skii otdel, 1960. 30 p. (MIRA 14:11)
(Steel--Welding)

BUDAROV, Ivan Prokof'yevich, kand.tekhn.nauk; RAZUMOVSKAYA, T.Ya., red.; DEMIDOV, Ya.F., tekhn.red.

[Evaporation losses of motor fuels in storage] Poteri ot isparenilia motornykh topliv pri khranenii. Moskva, VNIIST Glavgaza SSSR. Redaktsionno-izdatel'skii otdel, 1961. 262 p. (Motor fuels) (MIRA 15:5)

SAFARYAN, Misak Kapatetovich, kand. tekhn. nauk; ISHCHENKO, Yuriy Konstantinovich, inzh.; MESROPYAN, Nikolay Mushegovich, inzh.; RAZUMOVSKAYA, T.Ya., red.; DEMIDOV, Ya.F., tekhn. red.

[Study of the behavior of rectangular reinforced concrete tanks under the effect of temperature change; general conclusions from experience in design, construction, and operation]Issledovanie raboty priamougol'nykh zhelezobetonnykh rezervuarov pri temperaturnykh vozdeistviiakh; obobshchenie opyta proektirovaniia, stroitel'stva i ekspluatatsii. Moskva, VNIIST Glavgaza SSSR, redaktsionno-izdatel'skii otdel, 1961. 166 p.
(MIRA 15:9)

(Tanks) (Concrete construction)